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<b>(51) International Patent Classification <sup>6</sup>:</b> <b>A01N 59/00, A61L 2/18, C11D 3/48 //</b> <b>(A01N 59/00, 61:00, 59:00)</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 98/57544</b> <b>(43) International Publication Date:</b> 23 December 1998 (23.12.98)
<b>(21) International Application Number:</b> PCT/GB98/01599 <b>(22) International Filing Date:</b> 16 June 1998 (16.06.98)  <b>(30) Priority Data:</b> 9712680.9 18 June 1997 (18.06.97) GB  <b>(71) Applicant (for all designated States except US):</b> RECKITT & COLMAN PRODUCTS LIMITED [GB/GB]; 67 Alma Road, Windsor, Berkshire SL4 3HD (GB).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> HARRISON, Neale, Mark [GB/GB]; 27 Cromwell Close, Tutbury, Burton on Trent, Staffordshire DE13 9HZ (GB). FOX, Rodney, Thomas [GB/GB]; 30 South Street, Cottingham HU16 4AS (GB). GOREHAM, Philip, William [GB/GB]; 24 Lancelot Court, Victoria Dock, Hull HU9 1QD (GB). THACKER, Simon [GB/GB]; 22 Monroe Close, Lambwath Road, Hull HU8 0AX (GB).  <b>(74) Agents:</b> ILOTT, Elizabeth, Anne et al.; Reckitt & Colman plc, Group Patents Dept., Dansom Lane, Hull HU8 7DS (GB).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
<b>(54) Title:</b> IMPROVEMENTS IN OR RELATING TO DISINFECTING MATERIALS		
<b>(57) Abstract</b>  The invention provides a system for disinfecting a germ carrying body which system comprises two components wherein the first component comprises a disinfectant precursor and the second component comprises a compound which, on admixture with the first component, reacts with the precursor to form a disinfectant; wherein either component includes a substance which exhibits a colour change after a period of time has elapsed, subsequent to the application of the material to the body, which is at least as long as the time required for the material to disinfect the body.		

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Improvements in or relating to disinfecting materials

This invention relates to disinfecting materials and more particularly, but not exclusively, is concerned with toilet cleaners for disinfecting toilet bowls and  
5 the like.

Toilet cleaners are purchased by customers with a view to killing germs in the toilet bowl and also removing limescale and other stains. Typically,  
10 conventional toilet cleaners are based on sodium hypochlorite or hydrochloric acid and, although these are effective germ killers, they do not provide any indication that germs have been killed and hence the customers cannot readily perceive that the cleaners have fulfilled their purpose in this respect.  
15

It is an object of the present invention to provide a material which will disinfect toilet bowls and other bodies whilst also providing an indication that it has carried out its germ killing function.

20 According to the present invention there is provided a system for disinfecting a germ carrying body which system comprises two components wherein

the first component comprises a disinfectant precursor and

25 the second component comprises a compound which, on admixture with the first component, reacts with the precursor to form a disinfectant;

wherein either component includes a substance which exhibits a colour change after a period of time has elapsed, subsequent to the application of the material  
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to the body, which is at least as long as the time required for the material to disinfect the body.

5 Preferably, the substance exhibiting the colour change is a bleachable dye, particularly a dye which is bleachable by the disinfectant. The substance is preferably present in admixture with the first component.

10 Preferably the first component comprises the precursor in an amount of from 0.001 to 20 %, more preferably from 0.01 to 5 %, most preferably from 0.1 to 1 % by weight of the first component; the second component comprises the compound in an amount of from 0.001 to 20 %, more preferably from 0.01 to 5 %, most preferably from 0.05 to 1 %, by volume of the second component; and one or more of the components comprises 15 the substance in an amount of from 0.0001 to 2 %, more preferably from 0.001 to 0.5 %, most preferably from 0.01 to 0.1 %, by weight of the component(s) in which the substance is present.

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Preferably each component is in the form of an aqueous solution. Optionally each component additionally comprises additives such as stabilisers, buffers, preservatives, viscosity modifiers, perfumes and/or surfactants.

25

Suitable dyes are as follows:-

C.I. Acid Blue 182, such as Sandolan Blue E-HRL supplied by Clariant;

30 C.I. Acid Blue 80, an anthraquinone dyestuff, such as Sandolan Milling Blue N-BL;

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C.I. Reactive Blue 113, such as Drimarene Blue K3GL supplied by Clariant;

C.I. Reactive Blue 114 such as Drimarene Brilliant Blue K-BL;

5 Azo/copper complex dyestuffs such as Cartasol Blue GDF supplied by Clariant;

Anionic azo-dyes such as Cartasol Brilliant Violet 5BF.

10 A suitable bleaching agent which is formable from the two components is chlorine dioxide. In this case, a suitable precursor is an alkali metal chlorite, preferably sodium chlorite which, when admixed with an acid such as hydrochloric acid, sulphamic acid or citric acid (preferably hydrochloric acid is used), generates the chlorine dioxide.

15

According to a preferred embodiment of the invention the system is in the form of a container comprising:

20 a first compartment for said first component,  
a second compartment for said second component,  
a first outlet for egress of a stream of first component from said first compartment, and  
a second outlet for egress of a stream of said second component from said second compartment, said outlets being arranged such that the streams impinge on one another and the first and second components become  
25 admixed together when the components are poured from the container.

30 For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawing which shows a schematic cross

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section through a container in accordance with the invention.

Referring to the drawing, the container is a double  
5 container comprising a first compartment 1 and a second  
compartment 2. The compartments 1 and 2 have separate  
outlets 3 and 4 at the neck of the container and the  
container includes a common dividing wall 5 which  
extends beyond the outlets 3 and 4 to form a baffle 6.  
Both outlets 3 and 4 are sealed by a cap 7 threadingly  
10 connected to the neck of the container. Separate first  
and second components are accommodated in the first and  
second compartments 1 and 2 and are retained by the cap  
7.

In use, the cap 7 is unscrewed and the container is  
15 tilted so that a stream of the first component leaves  
the first compartment 1 via the first outlet 3 and a  
stream of the second component leaves the second  
compartment 2 via the second outlet 4. The baffle 6  
assists in causing these streams to intermingle and  
20 form a single stream of the mixed components.

The following Example illustrates the invention.

#### Example

A first component comprising an aqueous solution of  
25 sodium chlorite in an amount of 1% by weight of the  
first component and sufficient (0.02 % by weight) of  
the blue dye C.I. Acid Blue 182 to provide the first  
component with a blue colour was introduced into the  
first compartment 1 of a container as shown in the  
drawing. A second component comprising an aqueous  
30 colourless solution of hydrochloric acid in an amount

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of 1% by volume of the second component was introduced into the second compartment 2 of the container.

5 On pouring some (about 20 ml which consisted of about 10 ml of each component) of the contents from the container into a toilet bowl, the streams of the first and second components intermingled to form a blue mixture prior to reaching the toilet bowl. The mixture reacted to form chlorine dioxide ( $\text{ClO}_2$ ). This is an efficient germ killer and within 10 minutes it had  
10 disinfected the toilet bowl. It is known from microbiological tests that 10 minutes is a sufficient period of time for this amount of  $\text{ClO}_2$  to disinfect a toilet bowl.

15 Within 15 minutes of the mixing together of the first and second components, the blue mixture had become colourless as the chlorine dioxide had completely bleached the blue dye. Thus the user could readily perceive that the material had killed the germs in the toilet bowl.

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CLAIMS

1. A system for disinfecting a germ carrying body  
which system comprises two components wherein  
the first component comprises a disinfectant precursor  
5 and

the second component comprises a compound which, on  
admixture with the first component, reacts with the  
precursor to form a disinfectant;

wherein either component includes a substance which  
10 exhibits a colour change after a period of time has  
elapsed, subsequent to the application of the material  
to the body, which is at least as long as the time  
required for the material to disinfect the body.

2. A system according to claim 1 wherein said  
15 substance is a dye bleachable by the disinfectant.

3. A system according to claim 1 or claim 2 wherein  
the first component comprises the precursor in an  
amount of from 0.001 to 20 % by weight of the first  
component, the second component comprises the compound  
20 in an amount of from 0.001 to 20 % by volume of the  
second component and one or more of the components  
comprises the substance in an amount of from 0.0001 to  
2 %, by weight of the component(s) in which the  
substance is present.

25

4. A system according to any one of the preceding  
claims wherein the precursor is an alkali metal  
chlorite, the compound is an acid, the disinfectant is  
chlorine dioxide, the substance is a bleachable dye  
which is in admixture with the first component, and  
30 each component is in the form of an aqueous solution.



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5. A system according to any one of the preceding claims which is in the form of a container comprising:

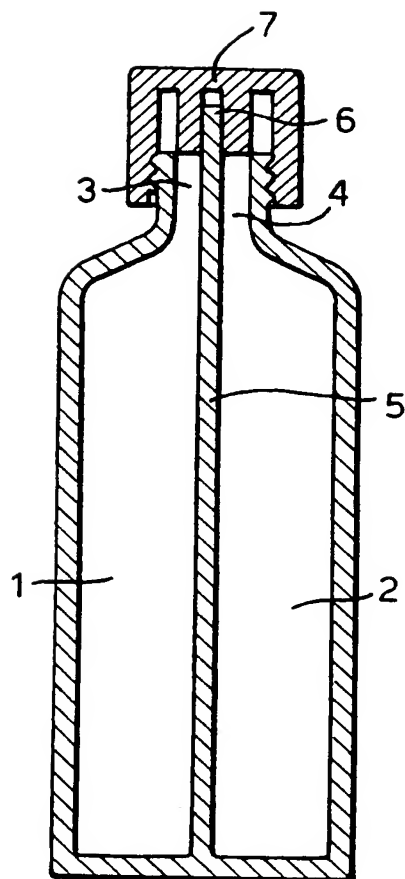
- a first compartment for said first component,
- a second compartment for said second component,
- 5 a first outlet for egress of a stream of first component from said first compartment, and
- a second outlet for egress of a stream of said second component from said second compartment, said outlets being arranged such that the streams impinge on
- 10 one another and the first and second components become admixed together when the components are poured from the container.

6. A container according to claim 5 substantially as  
15 hereinbefore described in the accompanying drawing.

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# INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/GB 98/01599

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 A01N59/00 A61L2/18 C11D3/48 //(A01N59/00,61:00,59:00)

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A01N A61L C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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